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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,234	03/10/2004	Shida Tan	ITL.1101US (P18723)	2960
21906 7590 03/22/2007 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			EXAMINER LEE, HWA S	
			ART UNIT	PAPER NUMBER
			2886	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/22/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/797,234	Applicant(s) TAN ET AL.	
	Examiner Andrew Hwa S. Lee	Art Unit 2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/14/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Oath/Declaration

It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either an application data sheet or supplemental oath or declaration.

It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

Election/Restrictions

1. Applicant's election of Group I (claims 1-12) in the reply filed on 1/12/07 is acknowledged. Applicant did not distinctly and specifically point out any errors in the restriction requirement, and thus the election has been treated as an election without traverse (MPEP § 818.03(a)).

Information Disclosure Statement

2. The information disclosure statement filed 6/14/04 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because U.S. Patent Application number 10/699,150 is not the correct application number. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement,

Art Unit: 2886

including all certification requirements for statements under 37 CFR 1.97(e). See MPEP

§ 609.05(a).

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-12 are provisionally rejected on the ground of nonstatutory obviousness-type

double patenting as being unpatentable over claims 1 and 6 of copending Application No.

10/746,078 in view of Hannah (US 6,774,333). This is a provisional obviousness-type double patenting rejection.

Application No. 10/746,078 shows a method of controlling carbon nanotubes using optical traps by using polarized laser (claim 6). Application No. 10/746,078 does not show that the alignment is monitored with another laser.

Smalley show a method to determine the alignment of nanotubes (Figure 2 and column 10, lines 1-47) and discusses the relationship between the polarized laser and the magnetic field (e.g. signal being maximum when light is perpendicular to magnetic field).

At the time of the invention, one of ordinary skill in the art would have used the alignment determining means taught by Smalley when manipulating nanotubes taught by Smalley in order to monitor the alignment of the nanotubes.

With respect to claim 2, Smalley shows the monitoring of intensity (column 10, lines 25-34).

With respect to claims 3-7, Application No. 10/746,078 shows the passages used for trapping and moving the nanotubes.

With respect to claim claims 9-11, Hannah and Application No. 10/746,078 show a polarizer to rotate the laser beam to rotate the nanotubes. Smalley shows a photodetector (218).

5. With respect to claim 12, the use of mirrors to direct light beams in the desired direction is of ordinary skill in the art. See for example, Smalley's mirrors in figure 2 (206, 208)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2886

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. **Claims 1-5 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smalley et al (US 6,790,425) in view of Hannah (US 6,774,333).**

Smalley et al. (Smalley hereinafter) show a method to determine the alignment of nanotubes (Figure 2 and column 10, lines 1-47) comprising the steps of:

illuminating a carbon nanotube with a first laser beam (202).

monitoring the effect on transmission of light from said first laser beam (column 10, lines 25-29).

Art Unit: 2886

Smalley discusses the relationship between the polarized laser and the magnetic field and how the magnetic field is used to control the orientation of the nanotubes. Smalley however does not show the use of a laser to control the orientation of the nanotubes rather than the magnetic field.

Hannah shows a method for optically manipulating carbon nanotubes by rotating polarized light (607) to rotate nanotubes. Hannah teaches that the optical means allow controlled manipulation, sorting, and rotation of nanotubes.

At the time of the invention, one of ordinary skill in the art would have monitored the alignment of the nanotubes taught by Smalley while using the optical manipulation of Hannah in order to control more aspects (e.g. target class, length, diameter) of the nanotubes and be able to control said aspects in a more finely controlled manner.

With respect to claim claims 9-11, Hannah shows a polarizer to rotate the laser beam to rotate the nanotubes. Smalley shows a photodetector (218).

With respect to claim 12, the use of mirrors to direct light beams in the desired direction is of ordinary skill in the art. See for example, Smalley's mirrors in figure 2 (206, 208)

10. Claims 1-5 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hannah in view of Smalley.

Art Unit: 2886

Hannah shows a method for optically manipulating carbon nanotubes by rotating polarized laser light (607) to rotate nanotubes. Hannah does not show that the alignment is monitored with another laser.

Smalley show a method to determine the alignment of nanotubes (Figure 2 and column 10, lines 1-47) and discusses the relationship between the polarized laser and the magnetic field (e.g. signal being maximum when light is perpendicular to magnetic field).

At the time of the invention, one of ordinary skill in the art would have used the alignment determining means taught by Smalley when manipulating nanotubes taught by Hannah in order to monitor the alignment of the nanotubes.

With respect to claim 2, Smalley shows the monitoring of intensity (column 10, lines 25-34).

With respect to claims 3-5, Smalley shows a cuvette (210) and it would be inherent that the nanotubes would be passed through the cuvette. In addition, the skilled artisan would have projected the beams to not pass through passageways in order for the passageways to not interfere with the light detection..

With respect to claim claims 9-11, Hannah shows a polarizer to rotate the laser beam to rotate the nanotubes. Smalley shows a photodetector (218).

With respect to claim 12, the use of mirrors to direct light beams in the desired direction is of ordinary skill in the art. See for example, Smalley's mirrors in figure 2 (206, 208)

11. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 20050147373) in view of Smalley.

Zhang shows a method of controlling carbon nanotubes using optical traps by using polarized laser. Zhang does not show that the alignment is monitored with another laser.

Smalley show a method to determine the alignment of nanotubes (Figure 2 and column 10, lines 1-47) and discusses the relationship between the polarized laser and the magnetic field (e.g. signal being maximum when light is perpendicular to magnetic field).

At the time of the invention, one of ordinary skill in the art would have used the alignment determining means taught by Smalley when manipulating nanotubes taught by Smalley in order to monitor the alignment of the nanotubes.

With respect to claim 2, Smalley shows the monitoring of intensity (column 10, lines 25-34).

With respect to claims 3-7, Zhang shows the passages used for trapping and moving the nanotubes.

With respect to claim claims 9-11, Hannah and Zheng show a polarizer to rotate the laser beam to rotate the nanotubes. Smalley shows a photodetector (218).

Art Unit: 2886

With respect to claim 12, the use of mirrors to direct light beams in the desired direction is of ordinary skill in the art. See for example, Smalley's mirrors in figure 2 (206, 208).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa S. Lee whose telephone number is 571-272-2419. The examiner can normally be reached on Tue-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Andrew Hwa S. Lee
Primary Examiner
Art Unit 2886